

What is claimed is:

1. A handheld diagnostic ultrasound system with head mounted display for ultrasound imaging allowing hands free operation comprising:

- means for processing the diagnostic ultrasound image;

- means for displaying said diagnostic ultrasound image;

- means for storing multiple diagnostic ultrasound images;

- means for powering the diagnostic ultrasound device;

- means for cable transfer of the diagnostic ultrasound image to pc or other storage;

- means for viewing the diagnostic ultrasound image in adverse lighting conditions;

- means for interrogating the tissue in the region of interest, electrically connected to said means for processing the diagnostic ultrasound image;

- means for beamforming the diagnostic ultrasound image, electrically connected to said means for

processing the diagnostic ultrasound image;

means for storing at least one frame of rf data, electrically embedded to said means for beamforming the diagnostic ultrasound image;

means for separating the incoming rf samples into i (in-phase) and q (quadrature) componets, electrically embedded to said means for beamforming the diagnostic ultrasound image;

means for program and data storage of the dual-core processor;

means for storing operating code of the dual core processor;

means for operator interface;

means for wireless transfer of the ultrasound image to pc or other storage;

means for converting lcd signals into composite ntsc video signals, electrically connected to said means for viewing the diagnostic ultrasound image in adverse lighting conditions; and

means for processing the ultrasound image for lcd display.

2. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for processing the diagnostic ultrasound image comprises a handheld, PDA style diagnostic ultrasound device.

3. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for displaying said diagnostic ultrasound image comprises a lcd display.

4. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for storing multiple diagnostic ultrasound images comprises a non-volatile secure digital flash card.

5. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for powering the diagnostic ultrasound device comprises

a li-ion battery.

6. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for cable transfer of the diagnostic ultrasound image to pc or other storage comprises an usb connection.

7. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for viewing the diagnostic ultrasound image in adverse lighting conditions comprises a head mounted display, having a wide field of view and audio ear speakers.

8. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for interrogating the tissue in the region of interest comprises an ultrasound probe.

9. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for beamforming the diagnostic ultrasound image comprises a low power, low voltage fpga.

10. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for storing at least one frame of rf data comprises a rf frame memory.

11. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for seperating the incoming rf samples into i (in-phase) and q (quadrature) componets comprises a baseband demodulation.

12. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for program and data storage of the dual-core processor

comprises a low power, low voltage, DDR sdram.

13. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for storing operating code of the dual core processor comprises a low power, low voltage, non-volatile disk on chip.

14. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for operator interface comprises a keypad and trackball.

15. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for wireless transfer of the ultrasound image to pc or other storage comprises a wireless link.

16. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for converting lcd signals into composite ntsc video signals comprises a graphics processor.

17. The handheld diagnostic ultrasound system with head mounted display in accordance with claim 1, wherein said means for processing the ultrasound image for lcd display comprises a lcd controller.

18. A handheld diagnostic ultrasound system with head mounted display for ultrasound imaging allowing hands free operation comprising:

- a handheld, PDA style diagnostic ultrasound device, for processing the diagnostic ultrasound image;

- a lcd display, for displaying said diagnostic ultrasound image;

- a non-volatile secure digital flash card, for storing multiple diagnostic ultrasound images;

- a li-ion battery, for powering the diagnostic

ultrasound device;

an usb connection, for cable transfer of the diagnostic ultrasound image to pc or other storage;

a head mounted display, having a wide field of view and audio ear speakers, for viewing the diagnostic ultrasound image in adverse lighting conditions;

an ultrasound probe, for interrogating the tissue in the region of interest, electrically connected to said diagnostic ultrasound device;

a low power, low voltage fpga, for beamforming the diagnostic ultrasound image, electrically connected to said diagnostic ultrasound device;

a rf frame memory, for storing at least one frame of rf data, electrically embedded to said FPGA;

a baseband demodulation, for seperating the incoming rf samples into i (in-phase) and q (quadrature) componets, electrically embedded to said FPGA;

a low power, low voltage, DDR sdram, for program and data storage of the dual-core processor;

a low power, low voltage, non-volatile disk on chip, for storing operating code of the dual core processor;

a keypad and trackball, for operator interface;
a wireless link, for wireless transfer of the
ultrasound image to pc or other storage;
a graphics processor, for converting lcd signals
into composite ntsc video signals, electrically
connected to said head mounted display; and
a lcd controller, for processing the ultrasound
image for lcd display.

19. The handheld diagnostic ultrasound system with head
mounted display as recited in claim 18, further comprising:

a low power, highly integrated dual-core processor,
for control and processing of all diagnostic ultrasound
images, electrically connected to said diagnostic
ultrasound device, electrically connected to said LCD
Display, electrically connected to said Secure Digital
Flash card, electrically connected to said USB
connection, electrically connected to said SDRAM,
electrically connected to said Disk On Chip,
electrically connected to said keypad and trackball,
electrically connected to said wireless link, and

electrically connected to said graphics processor.

20. A handheld diagnostic ultrasound system with head mounted display for ultrasound imaging allowing hands free operation comprising:

- a handheld, PDA style diagnostic ultrasound device, for processing the diagnostic ultrasound image;

- a lcd display, for displaying said diagnostic ultrasound image;

- a non-volatile secure digital flash card, for storing multiple diagnostic ultrasound images;

- a li-ion battery, for powering the diagnostic ultrasound device;

- an usb connection, for cable transfer of the diagnostic ultrasound image to pc or other storage;

- a head mounted display, having a wide field of view and audio ear speakers, for viewing the diagnostic ultrasound image in adverse lighting conditions;

- an ultrasound probe, for interrogating the tissue in the region of interest, electrically connected to said diagnostic ultrasound device;

a low power, low voltage fpga, for beamforming the diagnostic ultrasound image, electrically connected to said diagnostic ultrasound device;

a rf frame memory, for storing at least one frame of rf data, electrically embedded to said FPGA;

a baseband demodulation, for seperating the incoming rf samples into i (in-phase) and q (quadrature) componets, electrically embedded to said FPGA;

a low power, highly integrated dual-core processor, for control and processing of all diagnsotic ultrasound images, electrically connected to said USB connection, electrically connected to said Secure Digital Flash card, electrically connected to said LCD Display, and electrically connected to said diagnostic ultrasound device;

a low power, low voltage, DDR sdram, for program and data storage of the dual-core processor, electrically connected to said dual-core processor;

a low power, low voltage, non-volatile disk on chip, for storing operating code of the dual core processor, electrically connected to said dual-core processor;

a keypad and trackball, for operator interface,
electrically connected to said dual-core processor;

a wireless link, for wireless transfer of the
ultrasound image to pc or other storage, electrically
connected to said dual-core processor;

a graphics processor, for converting lcd signals
into composite ntsc video signals, electrically
connected to said dual-core processor, and electrically
connected to said head mounted display; and

a lcd controller, for processing the ultrasound
image for lcd display.